

Five new species of *Mydaea* from China (Diptera, Muscidae)

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Abstract

Five new species of *Mydaea* are described from China, namely *M. adhesipeda* Xue, **sp. nov.**, *M. combineriata* Xue, **sp. nov.**, *M. qingyuanensis* Xue, **sp. nov.**, *M. quinquiseta* Xue, **sp. nov.**, *M. wusuensis* Xue, **sp. nov.**, and an addendum to the key of the *Mydaea* in China is given.

Keywords

Calypttratae, description, key, Muscoidea, taxonomy

Introduction

Mydaea Robineau-Desvoidy, 1830 is a genus in the subfamily Mydaeinae (Diptera, Muscidae). It comprises approximately 120 species worldwide. About 100 species were recorded from the Palaearctic, 35 from the Nearctic, 26 from the Neotropical, nine from the Oriental, and two species from the Afrotropical regions (Hennig 1957; Hockett 1965; van Emden 1965; Vockeroth 1972; Pont 1977, 1980, 1986, 1989; Shinonaga 2003; Carvalho et al. 2005). Thirty species were reported from China, ap-

proximately one-fifth of the species worldwide (Ma et al. 1986; Xue 1992; Xue and Chao 1996; Feng 2000a, b, 2003; Xue and Tian 2012, 2014). During the study of our collection in recent years, five new species were found in the mountains from Liaoning, Heilongjiang, and Sichuan provinces and from the Ningxia Hui Autonomous Region of China. Descriptions, figures, and an addendum to the key to the Chinese species of the genus *Mydaea* are provided.

Methods and materials

The specimens examined for this study were collected by sweeping. The genitalia were detached from the abdomen, bleached by heating in a 10% NaOH solution (approximately 100 °C) for about 20 min, placed in a droplet of glycerol, and examined using an Olympus SZX7 stereomicroscope. After examination, the genitalia were stored in a small plastic vial filled with glycerin and pinned with the specimen. The type material is deposited in the Insect Collection, Shenyang Normal University, Shenyang, China (SYNU).

The morphological terminology follows that of Cumming and Wood (2017). Absolute measurements of the body length are in millimeters (mm). Adhesive hairs are special hair-like setae modified for climbing or gripping. The following abbreviations are used for various morphological structures: *acr*, acrostichal setae; *prst-acr*, presutural acrostichal setae; *dc*, dorsocentral setae; *ial*, intra-alar setae; *pra*, prealar setae; *av*, anteroventral setae; *ad*, anterodorsal setae; *pd*, posterodorsal setae; *p*, posterior setae; *pv*, posteroventral setae.

Results

Mydaea Robineau-Desvoidy, 1830

Mydaea Robineau-Desvoidy, 1830: 479. Type species: *Mydaea scutellaris* Robineau-Desvoidy, 1830 (by subsequent designation of Coquillett 1901).

Xenomydaea Malloch, 1920: 144. Type species: *Xenomydaea buccata* Malloch, 1920 (by original designation).

Generic diagnosis. Meron and anepimeron bare; katepisternal setae 1+2; lower margin of posterior spiracle without row of setae; Sc bent bow-shaped; dorsal and ventral surfaces of radial node with hairs, M_1 straight; lower calypter tongue-shaped; mid tibia with at least 2 *p*; hind coxa bare on posterior surface, hind tibia without *pd*. The cerci of all Chinese species have been divided into seven different kinds. We figure together these seven kinds to show their differences (Fig. 1).

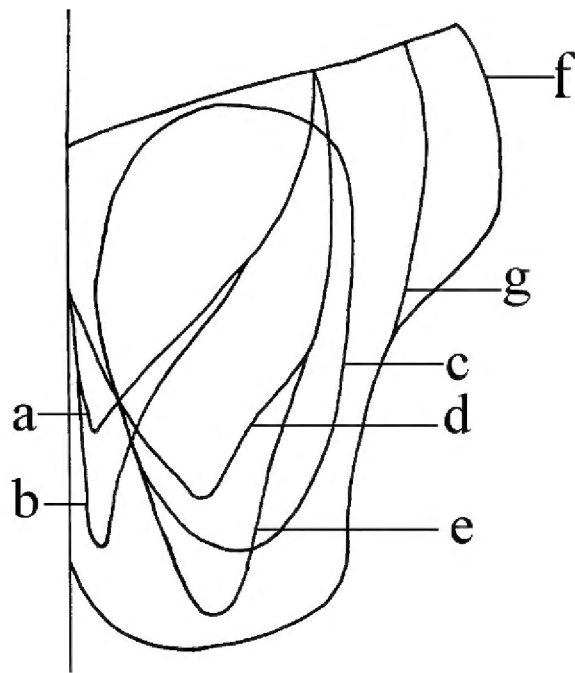


Figure 1. Cerci types of Chinese *Mydaea* **a** *M. subelecta* Feng, 2000; *M. gracilior* Xue, 1992 **b** *M. jiu-zhaigouensis* Feng & Deng, 2001; *M. nubila* Stein, 1916; *M. scolocerca* Feng, 2000 **c** *Mydaea ancilloides* Xue, 1992; *M. jubiventera* Feng & Deng, 2001; *M. fuchaoi* Xue & Tian, 2012; *M. flavifemora* Feng, 2000; *M. kangdinga* Xue & Feng, 1992; *M. setifemur* Ringdahl, 1924 **d** *M. brunneipennis* Wei, 1994; *Mydaea glaucina* Wei, 1994; *M. nigra* Wei, 1994; *M. shuensis* Feng, 2003; *M. minor* Ma & Wu, 1986; *M. sinensis* Ma & Cui, 1986; *M. franzosternita* Xue & Tian, 2014; *M. laxidetrita* Xue & Wang, 1992 **e** *M. nigribasica* Xue & Feng, 1996; *M. latielecta* Xue, 1992; *M. tinctoscutaris* Xue, 1992 **f** *M. affinis* Meade, 1891; *M. bideserta* Xue & Wang, 1992; *M. urbana* (Meigen, 1826) **g** *M. brevis* Wei, 1994; *M. emeishanna* Feng & Deng, 2001; *M. discocerca* Feng, 2000; *M. minutiglaucina* Xue & Tian, 2012.

Addendum to the key by Xue and Tian (2014) of *Mydaea* (males only)

- 7 Scutellum yellow or with yellow basal part 8
- Scutellum entirely black 7a
- 7a Hind femur black *M. wusuensis* Xue, sp. nov.
- Hind femur yellow or fuscous 11
- 8 Hind femur with *pv* in rows 9
- Hind femur with *pv* on the base at most 8a
- 8a Postpronotal lobe yellow *M. tinctoscutaris* Xue, 1992
- Postpronotal lobe black *M. quinquiseta* Xue, sp. nov.
- 9 Anterior spiracle yellow 9a
- Anterior spiracle fuscous 10
- 9a 2 *prst-acr* *M. gracilior* Xue, 1992
- *prst-acr* absent *M. qingyuanensis* Xue, sp. nov.
- 10 Coxae, trochanters of fore leg and all tarsi fuscous 10a
- All legs yellow *M. kangdinga* Xue & Feng, 1992
- 10a Ventral surface of fore femur fuscous on basal half *M. setifemur* Ringdahl, 1924
- Ventral surface of fore femur yellow on basal half *M. combiniseriata* Xue, sp. nov.

- 13 Frons subequal with anterior ocellus in width abdomen with shifting patches..... *M. discocerca* Feng, 2000
- Frons about 2 times as wide as anterior ocellus; abdomen without shifting patch...15
- 14 *Pra* about 1/2 of posterior notopleural seta in length; wing brown, basal half of hind femur with *pv* obviously.....19
- *Pra* longer than posterior notopleural seta; wing yellow, hind femur with sparse and short *pv*20
- 15 Antennal arista ciliated, the longest hair subequal with antennal postpedicel in width16
- Antennal arista short ciliated, the longest hair longer than antennal postpedicel in width17
- 16 Parafacial about 1/2 of postpedicel in width..... *M. brevis* Wei, 1994
- Parafacial subequal with postpedicel in width..... 16a
- 16a Basicosta dark-brown, *pra* approximately 1.3 times as long as posterior notopleural seta; fore tibia without median *p*, ventral surface of fore tarsus without adhesive hairs *M. fuchaoi* Xue & Tian, 2012
- Basicosta yellow, *pra* shorter than posterior notopleural seta; fore tibia with 1 median *p*, ventral surface of fore tarsus with adhesive hairs *M. adhesipeda* Xue, sp. nov.

***Mydaea adhesipeda* Xue, sp. nov.**

<http://zoobank.org/C84CC490-8266-4ACD-96AC-2FE70E5E5058>

Type material. Holotype. China, 1 ♂, Ningxia Hui Autonomous Region, Jingyuan, Liupan Mountains, 35°39'N, 106°34'E, alt. 2200 m, 3 July 2009, Zhiyuan Yao, (SYNU). **Paratypes.** 2♂♂, 5 ♀♀, same data as holotype.

Diagnosis. *Post-dc* 4, scutellum dark black; basal and apical scutellar seta approximately as long as hind tibia; coxae and trochanters brown, tarsi dark brown, ventral surface of fore tarsus with adhesive hairs; femora and tibiae yellow; hind femur with *av* rows on distal half.

Description. Male. Body length 8.0–8.5 mm. **Head:** eyes bare, facets on upper half not enlarged. Frontal vitta black; lunule brown; genal and postgenal hairs entirely black; antenna fuscous, palpus black. Frons as wide as postpedicel, and slightly wider than distance between outer margins of posterior ocelli; fronto-orbital plate narrow, 2/5 of width of frons at middle; fronto-orbital plates, parafacials and genae covered with sparse gray pruinosity, parafacials as wide as or narrower than the width of postpedicel; genal height approximately 1/9 of eye height; lower face not projecting, vibrissal angle situated behind frontal angle in lateral view. Frontal setae with 7 or 8 pairs, upper 2 pairs short and situated on lower 4/5 of frons; proclinate orbital setae absent; ocellar setae approximately 2/3 of lower pair of frontal setae in length; postpedicel 3.5 times as long as wide; arista ciliated and longest hair approximately as long as width of postpedicel; palpi as long as prementum; prementum 2.5 times as long as wide, and covered with gray pruinosity; labellum extending to posterior part, and approximately 4/5 as long as palpi. **Thorax:** ground color black, covered with sparse gray pruinosity and slightly shining;

scutum with 4 black vittae, and the inner vitta extending to scutoscutellar suture; *acr* 0+1; *dc* 2+4; *ial* 0+2; *pra* slightly shorter than posterior notopleural seta; notopleuron with small hairs; scutellum black, basal and apical scutellar seta strong, approximately as long as hind tibia; basisternum of prosternum, anepimeron, meron, and katepimeron bare; katepisternal setae 1+2; 1 anepisternal seta; anterior and posterior spiracles yellow. **Wings:** semi-hyaline; tegula dark brown; basicosta yellow; ventral surface of vein C with hairs; vein Sc bow-shaped; dorsal and ventral surfaces of radial node with hairs; the middle part of crossvein dm-m bent towards base of wing, areas around crossveins r-m and dm-m not clouded; R_{4+5} and M_1 straight and diverging slightly distally; calypter yellowish, lower calypter tongue-shaped; halter knob yellow. **Legs:** coxae and trochanters brown, tarsi dark brown, femora and tibiae yellow; ventral surface of fore tarsus with adhesive hairs, fore tibia with 1 median *p*; mid femur without *av* and 6 *pv* on basal half, 2 preapical *ad*, 3 *pd*, mid tibia with 2 or 3 (a few with 4) *pv*; hind femur with *av* rows on distal half, *av* short on basal half, without *pv*, hind tibia with 4 *av*, 2 *ad*, without apical *pv*; tarsi longer than tibiae; fore claws and pulvilli approximately 1.2 times as long as tarsomere 5, mid claws and pulvilli approximately as long as tarsomere 5, hind claws and pulvilli shorter than tarsomere 5. **Abdomen:** Black in ground color, ovate in dorsal view, covered with gray pruinosity, both sides without color shifting patch, tergites 3 and 4 with a black median vitta, tergites 4 and 5 each with a complete row of posterior marginal setae, both sides of tergite 5 with 3 or 4 discal setae on anterior half; sternite 1 bare; middle part of lateral margin of cerci invaginated slightly in posterior view.

Female. Body length 8.9–9.5 mm. Frontal vitta 3.5 times as wide as fronto-orbital plate; 7 frontal setae; 2 upper orbital setae; genal height approximately 1/6 of eye height; ventral surface of fore tarsus without adhesive hairs; mid tibia with 3 or 4 *p*; fore claws and pulvilli shorter than tarsomere 5. Other characters as in male.

Remarks. This species is similar to *Mydaea fuchaoi* Xue & Tian, but differs from the latter in the following features: frontal vitta narrower; genae approximately 1/9 of eye height; palpi shorter; fore claws and pulvilli longer, fore tibia with 1 median *p*; ventral surface of fore tarsus with adhesive hairs; hind claws and pulvilli shorter, hind tibia with 4 *av*; middle part of lateral margin of cerci slightly concave in posterior view.

Etymology. The species name refers to ventral surface of the male fore tarsus which has adhesive hairs. It is derived from the Latin words *adhes* meaning adhesive and *ped* meaning leg.

Distribution. China, Ningxia Hui Autonomous Region (Liupan Mountains).

***Mydaea combiniseriata* Xue, sp. nov.**

<http://zoobank.org/CD4832B2-CB16-4CB4-9672-F78F044B8C2F>

Type material. Holotype. China, 1 ♂, Liaoning Province, Qingyuan, 41°81'N, 124°91'E, alt. 800 m, 3 June 2016, Bing Li, (SYNU). **Paratypes.** 3 ♂♂, same data as holotype.

Diagnosis. 5 or 6 frontal setae situated on lower half of frons; scutellum yellow; postpronotal lobe black; anterior spiracle fuscous; legs with femora and tibiae yellow; only distal part of hind femur with distinct *pv* and 5 or 6 small *pv* on basal half.

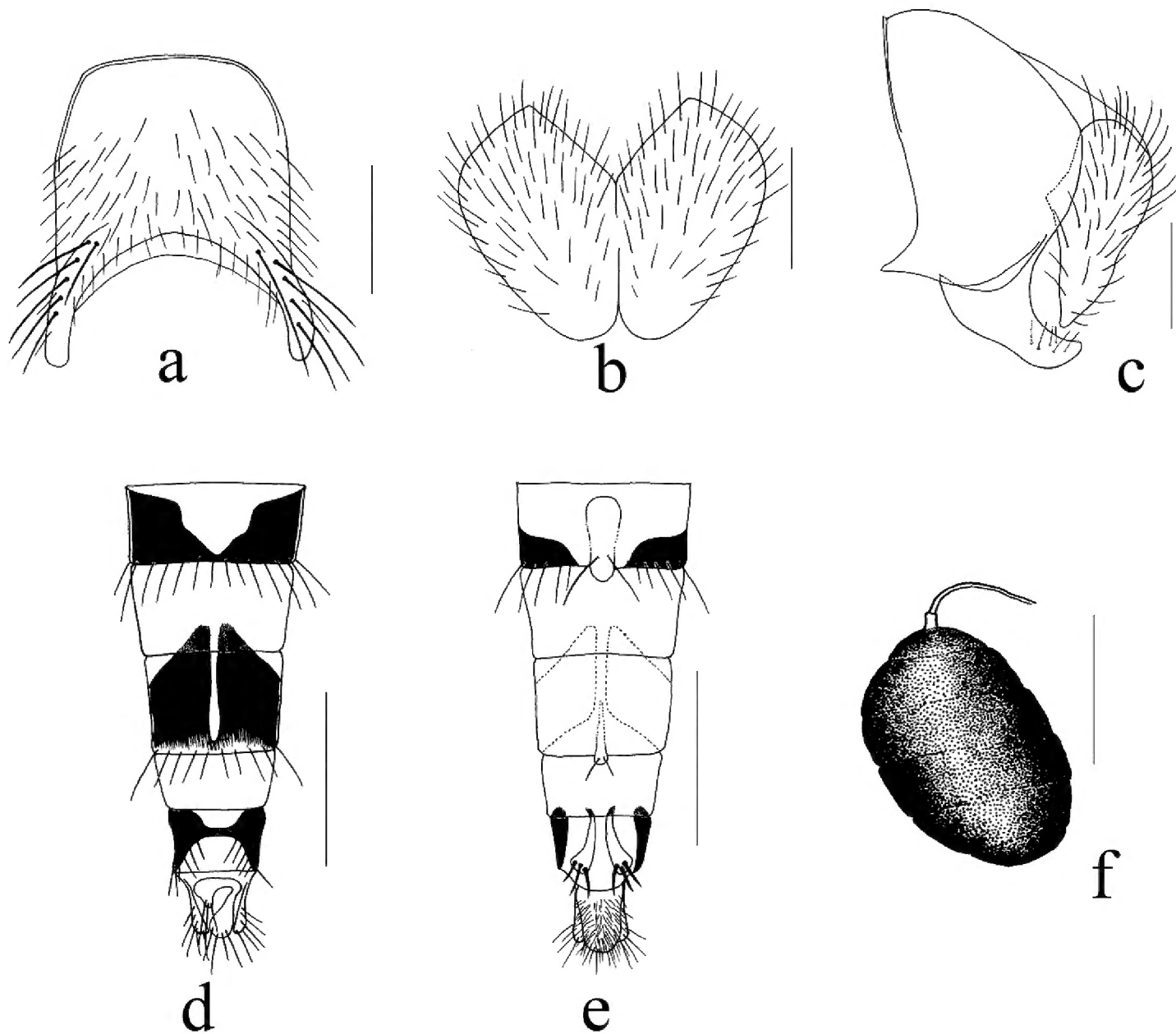


Figure 2. *Mydaea adhesipeda* Xue, sp. nov. **a** male, sternite 5 in ventral view **b** male, cerci in posterior view **c** male, terminalia in profile **d** female, ovipositor in dorsal view **e** female, ovipositor in ventral view **f** female, spermatheca. Scale bars: 0.50 mm (**a**); 0.20 mm (**b,c**); 0.20 mm (**d,e**); 0.10 mm (**f**).

Description. Male. Body length 7.2–7.4 mm. **Head:** eyes bare, frontal vitta black, fronto-orbital plates and parafacials brown, mediane red-brown; antennae black, arista brown-yellow; lunule dark brown; genae black, genal and postgenal hairs entirely black; palpi black. Frons less than twice the width of anterior ocellus; fronto-orbital plates contiguous in the middle; frontal triangle on upper 1/3 of frons; fronto-orbital plates and parafacials covered with sparse gray pruinosity, parafacial approximately 1/2 as wide as postpedicel; genal height approximately 1/9 of eye height, genae covered with gray pruinosity; lower face not projecting, vibrissal angle situated behind frontal angle in lateral view. 5 or 6 pairs frontal setae situated on lower half of frons; proclinate orbital setae absent; ocellar setae long and strong, slightly longer than the lower frontal setae; postpedicel approximately 3.5 times as long as wide; arista plumose, the longest hairs approximately 4/5 as width of width of postpedicel; palpus black, approximately 1.5 times as long as prementum, prementum short, approximately 1.5 times as long as high, and covered with sparse gray pruinosity; labellum long and big, the length of labellum approximately twice as long as height of prementum. **Thorax:** fuscous, only scutellum

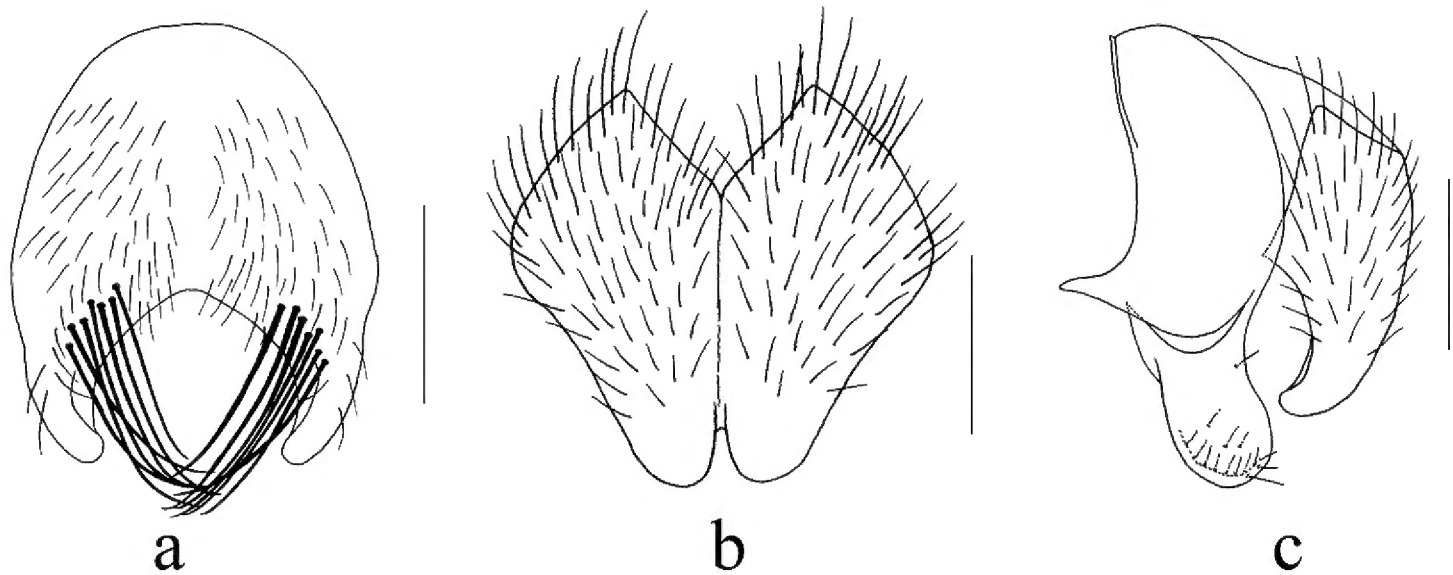


Figure 3. *Mydaea combiniseriata* Xue, sp. nov. **a** male, sternite 5 in ventral view **b** male, cerci in posterior view **c** male, terminalia in profile. Scale bars: 0.50 mm (**a**); 0.25 mm (**b,c**).

yellow, covered with sparse gray pruinosity; scutum with 4 black vittae, and the inner vittae extending to scutoscutellar suture; *acr* 0+1; *dc* 2+4; *ial* 0+2; *pra* strong, approximately 1.3 times as long as posterior notopleural seta; lateral and ventral surfaces of scutellum without hairs; basisternum of prosternum, anepimeron, meron, katepimeron bare; notopleuron with hairs; katepisternal setae 1+2; anterior spiracle fuscous and posterior spiracle light brown. **Wings:** semi-hyaline and slightly brown; base of wing pale yellow; tegula and basicosta yellow; costal spine small; ventral surface of vein C with hairs; vein Sc bow-shaped; crossvein r-m straight, crossvein dm-m bent towards base of wing, areas around crossveins r-m and dm-m not clouded; dorsal and ventral surface of radial node with hairs; R_{4+5} and M_1 straight, apical part of M_1 bent forward slightly; calypter pale yellow, lower calypter tongue-shaped; halter knob yellow. **Legs:** femora and tibiae yellow but dorsal surface of fore femur fuscous; coxae, trochanters, and tarsi fuscous; fore tibia without median *p*; mid femur with *pv* row on basal half, 1 apical *ad*, 3 apical *pd*, mid tibia with 3 *p*; hind femur with distinct *av* and *pv* only at distal part, and 5 or 6 small *pv* on basal half; hind tibia with 2 *pd*, 5 *pv*; tarsi slight longer than tibiae; only fore claws longer than pulvilli, mid and hind claws shorter than pulvilli, fore claws approximately as long as tarsomere 5. **Abdomen:** black in ground color, covered with light gray pruinosity, both sides of abdomen without color shifting patch, tergite 3 with a complete row of posterior marginal setae, but short and sparse, median pair shorter than half the length tergite 3, tergites 4 and 5 with complete rows of posterior marginal setae and these slightly longer, approximately 3/5 of the length of the tergite, tergite 4 with 3 pairs of discal setae, tergite 5 with 4 pairs of discal setae; posterior margin of sternites 2 and 3 each with a pair of apical setae, posterior margin of sternite 4 with 2 pairs of apical setae, inner margin of lateral lobe at basal part of sternite 5 with a row of 6 or 7 close-set setae, sursyli near rectangle, and inner margin with hairs.

Female. Unknown.

Remarks. This species is similar to *Mydaea corni* (Scopoli, 1763), but differs from the latter in the following features: male eyes bare; 5 or 6 pairs of frontal setae situated on lower half of frons; genal height approximately 1/9 of eye height; *acr* 0+1; *pra* long

and large, approximately 1.3 times as long as posterior notopleural seta; hind tibia without *ad*; both sides of abdomen without color shifting patches.

Etymology. The species name refers to the lobe of sternite 5, which in males have a long row of setae. It is derived from the Latin words *combin* meaning combined and *seriat* meaning rows.

Distribution. China, Liaoning Province (Qingyuan).

***Mydaea qingyuanensis* Xue, sp. nov.**

<http://zoobank.org/A9C2CC5B-E88B-4F91-9B6A-275FE9403DB9>

Type material. Holotype. China, 1 ♂, Liaoning Province, Qingyuan, 41°81'N, 124°91'E, alt. 800 m, 3 June 2016, Bing Li, (SYNU). **Paratypes.** 2♂♂, same data as holotype.

Diagnosis. Frons narrower than the width of anterior ocellus; scutellum yellow, *prst-acr* absent, *post-dc* 4, anterior and posterior spiracle yellow; hind femur with complete *pv* row, hind tibia without *ad*.

Description. Male. Body length 7.8–8.0 mm. **Head:** eyes bare; frontal vitta black; antennae black, lunule brown; genae black, genal and postgenal hairs entirely black; palpi black. Frons narrower than the width of anterior ocellus; fronto-orbital plates contiguous in the middle; frontal vitta situated on upper 2/5 of frons; Fronto-orbital plates and parafacials covered with sparse gray pruinosity, parafacials approximately 3/5 as wide as postpedicel; lower face not projecting, vibrissal angle situated behind frontal angle in lateral view; genae covered with gray pruinosity, genal height approximately 1/9 of eye height. Frontal setae in 13 or 14 pairs and extending upwards to anterior ocellus, 5 or 6 strong pairs on lower 2/5 of frons, 7 or 8 extremely small pairs on upper 3/5 and these shorter than eye facets; proclinate orbital setae absent; ocellar setae strong, slightly longer than the lower frontal setae; postpedicel approximately 3.5 times as long as wide, arista plumose, longest hairs approximately as long as width of postpedicel; palpus approximately 1.5 times as long as prementum, prementum short, approximately 1.5 times as long as high, and covered with sparse gray pruinosity; labellum long and big, the length of labellum approximately twice the height of prementum. **Thorax:** black, but scutellum yellow, covered with sparse gray pruinosity; scutum with 4 black vittae, and inner vitta not extending to scutoscutellar suture; *acr* 0+1; *dc* 2+4; *ial* 0+2; *pra* distinct, slightly shorter than posterior notopleural seta; lateral and ventral surfaces of scutellum without hairs; basisternum of prosternum, anepimeron, meron, and katepimeron bare; notopleuron with hairs; katepisternal setae 1+2; anterior and posterior spiracles yellow. **Wings:** semi-hyaline and pale brown; tegula and basicosta yellow; costal spine slightly short than crossvein r-m; ventral surface of vein C with hairs; vein Sc bow-shaped; areas around crossveins r-m and dm-m not clouded and straight; dorsal and ventral surface of radial node with hairs; R_{4+5} and M_1 straight, apical part of M_1 slightly bent forward; calypter yellow, lower calypter tongue-shaped; halter knob yellow. **Legs:** Tibiae and femora brown-yellow; coxae, trochanters and tarsi dark brown; fore tibia without median *p*; mid femur without distinct *av*, 1 apical *ad*, 3 apical *pd*, complete *pv* rows, mid tibia with 3 *p*; hind femur with complete *av* and

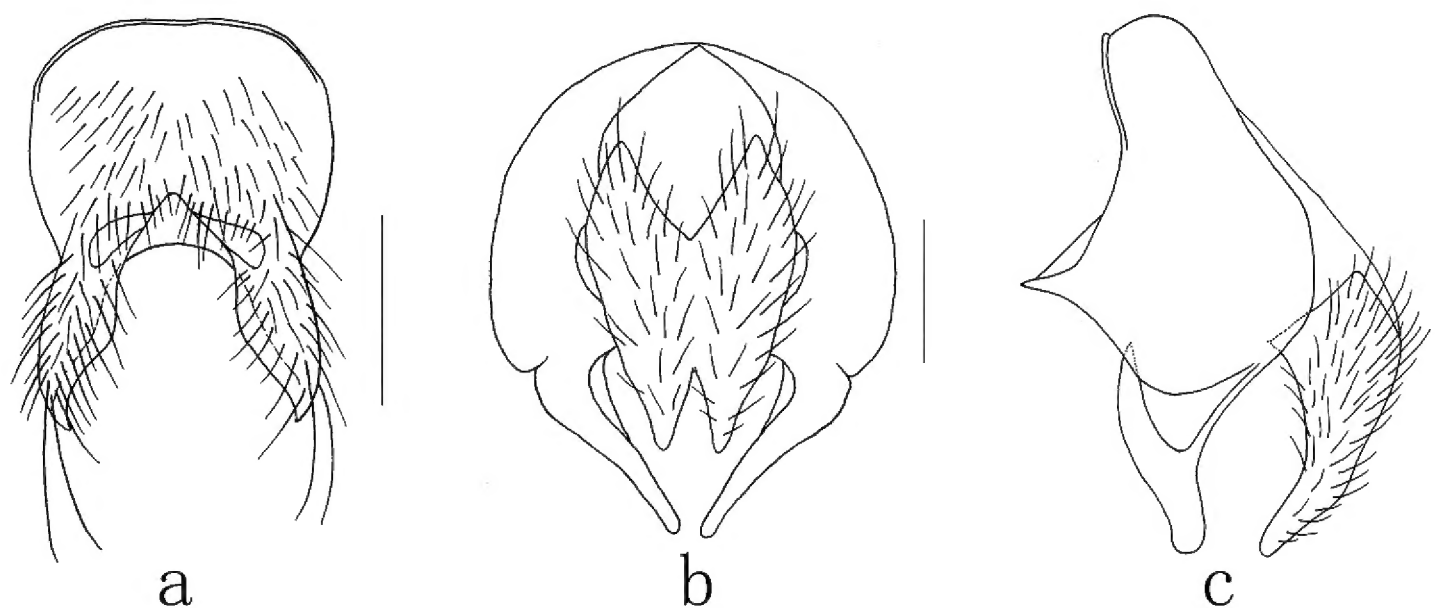


Figure 4. *Mydaea qingyuanensis* Xue, sp. nov. **a** male, sternite 5 in ventral view **b** male, terminalia in posterior view **c** male, terminalia in profile. Scale bars: 0.50 mm (**a**); 0.20 mm (**b**); 0.25 mm (**c**).

pv rows, hind tibia with 2 *pd*, 2 *pv*; tarsi slight longer than tibiae; pulvilli longer than claws, pulvilli approximately 2/3 of tarsomere 5 in length. **Abdomen:** ground color black; ovate in dorsal view, tergites 3–5 with a median black vitta, both sides of tergites 4 and 5 with distinct color shifting patches, tergites 3–5 with a complete posterior marginal rows of setae, tergites 4 and 5 with 4 or 5 pairs of discal setae, sternite 1 bare, apical margin of sternites 2–4 each with a pair of marginal setae; distal part of cerci and sursyli tapering in posterior view, dispart of cerci triangular in posterior view, sursyli narrowed on distal half in profile and bent backwards.

Female. Unknown.

Remarks. This species is similar to *Mydaea corni* (Scopoli, 1763), but differs from it in the following features: male eyes bare; frontal setae in 13 or 14 pairs and extending upwards to anterior ocellus, 5 or 6 strong pairs on lower 2/5 of frons, 7 or 8 extremely small pairs at upper 3/5 and these shorter than facets of eye; postpedicel approximately 3.5 times as long as wide; genal height approximately 1/9 of eye height; *acr* 0+1; *dc* 2+4; *pra* shorter than posterior notopleural seta; posterior spiracle yellow; hind tibia without *ad*.

Etymology. The species is named for the type locality, Qingyuan county.

Distribution. China, Liaoning Province (Qingyuan).

***Mydaea quinquiseta* Xue, sp. nov.**

<http://zoobank.org/18E8DE94-D3F6-49AB-A66C-C545926A3CC0>

Type material. Holotype. China, 1 ♂, Sichuan Province, Luding, Yanzigou, 29°38'N, 102°07'E, alt. 2600 m, 17 June 2006, Jiayu Liu, (SYNU). **Paratypes.** 2♂♂, same data as holotype.

Diagnosis. Eyes bare; *post-dc* 4; distal and lateral part of scutellum yellow; anterior and posterior spiracle brown; legs brown-yellow; both sides of abdomen without color shifting patch; cerci circular apically in posterior view.

Description. Male. Body length 7.4–7.6 mm. **Head:** eyes bare, facets on upper half not enlarged; frontal vitta black; antennae black, arista brown; lunule brown; genae black, genal and postgenal hairs entirely black; palpi black. Frons approximately 1.5 times as wide as anterior ocellus; fronto-orbital plates contiguous in the middle; frontal vitta triangle on upper 1/4 of frons; fronto-orbital plates and parafacial covered with distinct gray pruinosity, parafacial approximately 3/5 as wide as postpedicel; postpedicel approximately 3.5 times as long as wide; lower face not projecting, vibrissal angle situated behind frontal angle in lateral view; genae covered with gray pruinosity, genal height approximately 1/9 of eye height. Frontal setae in 13 or 14 pairs and these situated on lower half of frons; proclinate orbital setae absent; ocellar setae long and strong, slightly longer than the lower frontal setae; arista short plumose, maximum length of hairs approximately 2/3 of the width of postpedicel; palpus approximately 1.5 times as long as prementum, prementum approximately 2.2 times as long as high, and covered with gray pruinosity; labellum strong, extending to posterior part, and slightly longer than palpi. **Thorax:** black, but distal and lateral parts of scutellum yellow, covered with sparse gray pruinosity; scutum with 4 indistinct vittae and the inner vittae not extending to scutoscutellar suture; *acr* 0+1; *dc* 2+4; *ial* 0+2; *pra* long and strong, slightly longer than posterior notopleural seta; notopleuron with small hairs; lateral and ventral surfaces of scutellum without hairs; basisternum of prosternum, anepimeron, meron and katepimeron bare; katepisternal setae 1+2; anterior and posterior spiracles brown. **Wings:** semi-hyaline and basal part brown; tegula and basicosta yellow; costal spine small; ventral surface of vein C with hairs; Sc bow-shaped; middle part of crossvein dm-m bent towards base of wing, area around crossveins r-m and dm-m not clouded; dorsal and ventral surfaces of radial node with hairs; R_{4+5} and M_1 straight, apical part of M_1 bent forward slightly; calypter slightly brown; lower calypter tongue-shaped; halter knob yellow. **Legs:** entirely black; fore tibia without median *p*; mid femur with a row of *pv* on basal 3/5, and a row of *a* setae on basal half, 1 apical *ad*, 3 apical *pd*, mid tibia with 3 *p*; hind femur with a distinct row of *av* on distal half, and *pv* on basal half shorter than transverse diameter of hind femur, hind tibia with 4 or 5 *av*, 2 *ad*, without *pv*; claws as long as pulvilli, and short than tarsomere 5. **Abdomen:** ground color black; ovate in dorsal view, covered with gray pruinosity, both sides without color shifting patch, tergites 3 and 4 with median black vittae, tergites 4 and 5 each with a complete row of posterior marginal setae, tergite 5 with lateral discal setae on anterior half and otherwise devoid of hairs, sternite 1 bare, sternite 5 with 5 strong, median setae; cerci circular apically in posterior view.

Female. Unknown.

Remarks. This species is similar to *Mydaea gracilior* Xue, 1992, but differs from the latter in the following features: facets on upper half of eyes not enlarged; *acr* 0+1; *pv* on basal half of hind femur shorter than transverse diameter of hind femur; cerci circular apically in posterior view; distal parts of cerci and surstyli not bent in opposite directions.

Etymology. The species name refers to the lobe of sternite 5 which in males has 5 strong setae. It is derived from the Latin words *quinqu* meaning five and *seta* meaning setae.

Distribution. China, Sichuan Province (Yanzigou).

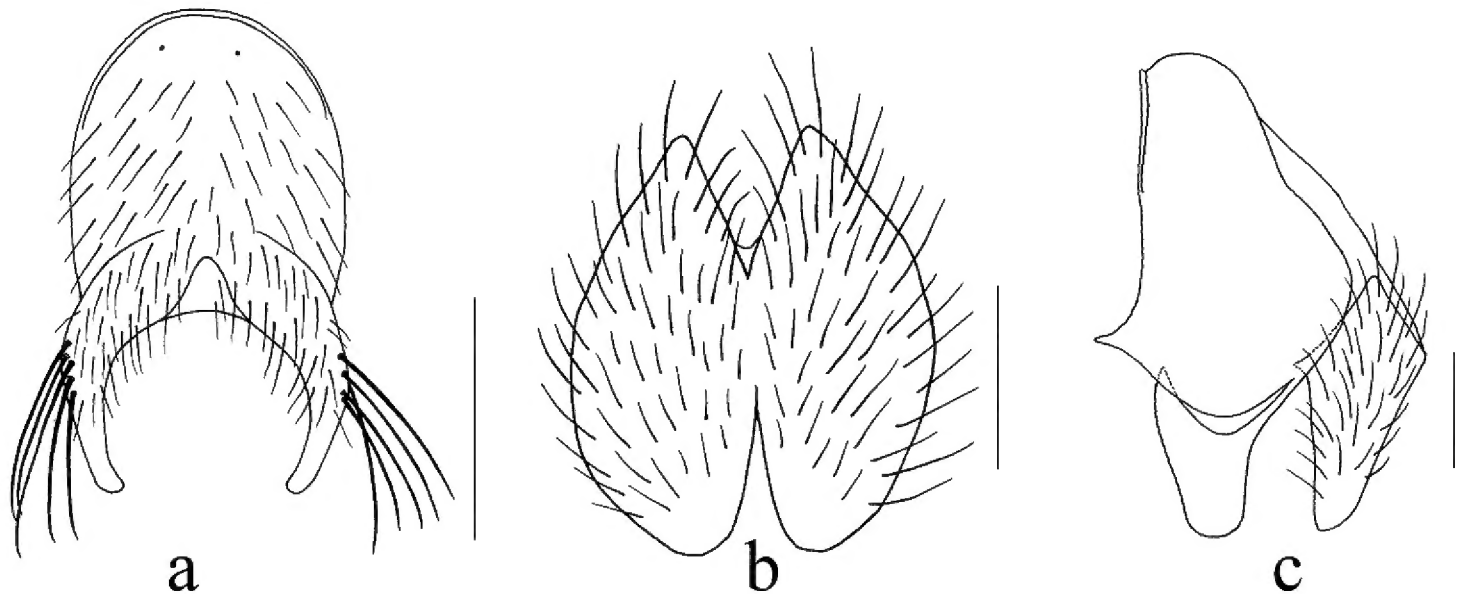


Figure 5. *Mydaea quinquiseta* Xue, sp. nov. **a** male, sternite 5 in ventral view **b** male, cerci in posterior view **c** male, terminalia in profile. Scale bars: 0.50 mm (**a**); 0.20 mm (**b,c**)

***Mydaea wusuensis* Xue, sp. nov.**

<http://zoobank.org/5A203D16-965B-4634-BE42-03552051AF28>

Type material. Holotype. China, 1 ♂, Heilongjiang Province, Jiamusi, Wusuzhen, 48°15'N, 134°12'E, alt. 80 m, 18 May 2017, Bo Hao, (SYNU). **Paratypes.** 2♂♂, same data as holotype.

Diagnosis. Scutellum and legs black; hind femur without *pv*; lateral lobes of sternite 5 short, and basal part near quadrate; cerci distinctly narrowed on distal half in posterior view and rounded on apical part, distal parts of cerci and surstyli bent in opposing directions; in lateral view only surstyli bent posteriorly.

Description. Male. Body length 5.4–5.6 mm. **Head:** eyes bare, frontal vitta black; antenna black, arista brown; lunule brown; genae black, genal and postgenal hairs entirely black; palpi black. Frons approximately 1.5 times as wide as anterior ocellus; fronto-orbital plates contiguous in the middle; frontal vitta triangle on upper 1/3 of frons; fronto-orbital plates and parafacial covered with sparse gray pruinosity, parafacials approximately 2/5 width of postpedicel; lower face not projecting, vibrissal angle situated behind frontal angle in lateral view; genae covered with gray pruinosity, genal height approximately 1/9 of eye height; Frontal setae in 7–8 pairs and these situated on lower 3/5 of frons; proclinate orbital setae absent; ocellar setae long and strong, slightly longer than lower frontal setae; postpedicel approximately 3.0 times as long as wide; arista short plumose, maximum length of hairs approximately 2/3 of width of postpedicel; palpi approximately 1.2 times as long as prementum, prementum approximately 2.2 times as long as high, and covered with gray pruinosity; labellum long and large, extending to posterior part and approximately as long as palpi. **Thorax:** ground color black; covered with sparse gray pruinosity; scutum with 4 black vittae, and the inner vittae not extending to scutoscutellar suture; *acr* 0+1; *dc* 2+4; *ial* 0+2; *pra* approximately as long as posterior notopleural seta; notopleuron with small hairs; scutellum same color as thorax and lateral and ventral surfaces of scutellum with-

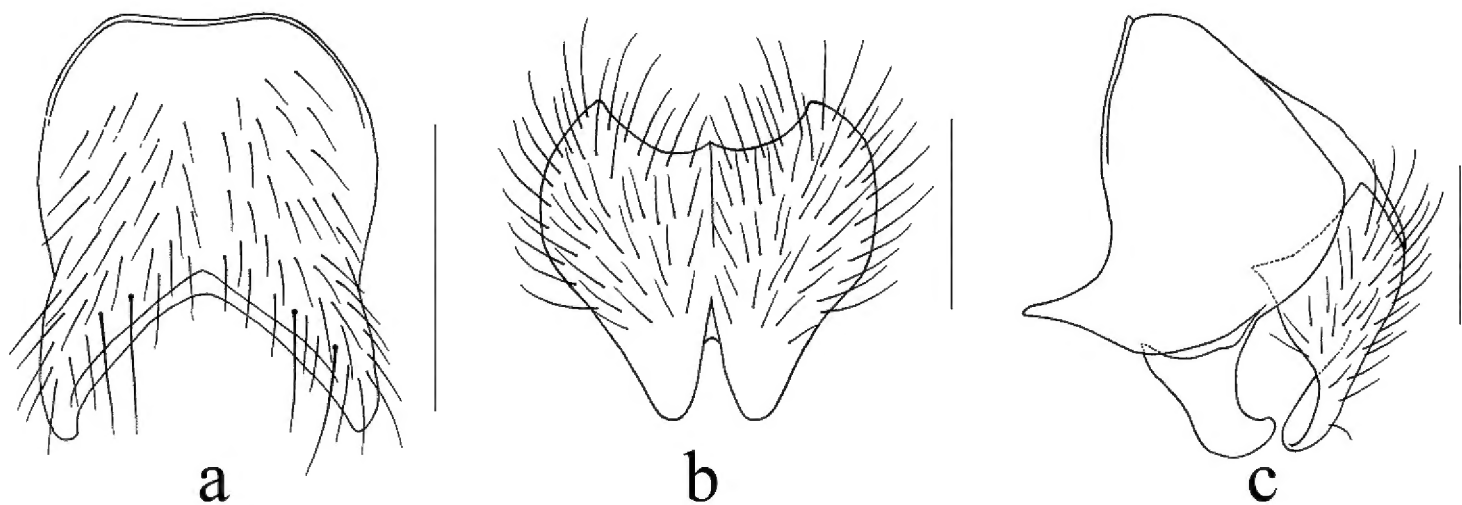


Figure 6. *Mydaea wusuensis* Xue, sp. nov. **a** male, sternite 5 in ventral view **b** male, cerci in posterior view **c** male, terminalia in profile. Scale bars: 0.50 mm (**a**); 0.20 mm (**b,c**).

out hairs; apical scutellar setae strong, slightly longer than posterior notopleural seta; basisternum of prosternum, anepimeron, meron and katepimeron bare; katepisternal setae 1+2; anterior and posterior spiracles brown. **Wings:** semi-hyaline, tegula black; basicosta yellowish brown; costal spine short; vein Sc bow-shaped; crossvein dm-m straight, areas around crossveins r-m and dm-m not clouded; dorsal and ventral surfaces of radial node with hairs; R_{4+5} and M_1 straight; calypter light brown, lower calypter tongue-shaped; halter knob brown-yellow. **Legs:** entirely black; fore tibia without median *p*; mid femur with *pv* and *a* rows of setae on basal half, 1 apical *ad*, 1 *av* on basal part, 2 apical *pd*, mid tibia with 3 *p*; hind femur with a distinct row of *av* on basal 2/5, without *pv*, hind tibia with 2 *av*, 2 *ad*, without apical *pv*; claws as long as pulvilli, and shorter than tarsomere 5. **Abdomen:** ground color black; ovate in dorsal view, covered with gray pruinosity, both sides without color shifting patch, tergites 3–5 with a median black vitta, tergites 4 and 5 each with a complete row of posterior marginal setae, tergite 5 with 4 or 5 discal setae; sternite 1 bare, lateral lobe sternite 5 short, and basal part near quadrate; cerci narrowing distinctly in posterior view and rounded on apical part, distal parts of cerci and surstyli bent in opposing directions; in lateral view only surstyli bent posteriorly.

Female. Unknown.

Remarks. This species is similar to *Mydaea ancilloides* Xue, 1992, but differs from it in the following features: male arista short-plumose, longest hair shorter than width of postpedicel; lower 3/5 of frons without frontal setae; parafacial approximately 2/5 of postpedicel in width; sternite 5 lateral lobe short and basal part near quadrate.

Etymology. The specific name refers to its type locality, Wusu town.

Distribution. China, Heilongjiang Province (Wusuzhen).

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References

- Carvalho CJB, Couri MS, Pont AC, Pamplona D, Lopes SM (2005) A catalogue of the Muscidae (Diptera) of the Neotropical Region. *Zootaxa* 860: 135–148. <https://doi.org/10.11646/zootaxa.860.1.1>
- Cumming JM, Wood DM (2017) Adults Morphology and Terminology. In: Kirk-Spriggs AH, Sinclair BJ (Eds) *Manual of Afrotropical Diptera* (Vol. 1). Introduction Chapter and Keys to Diptera Families. South African National Biodiversity Institute, Pretoria, 89–133.
- Feng Y (2000a) Five new species of Muscidae from Sichuan, China (Diptera). *Entomotaxonomia* 22(1): 53–60.
- Feng Y (2000b) Eight new species of Muscidae from Sichuan, China (Diptera: Muscidae). *Sichuan Journal of Zoology* 19(1): 3–8.
- Feng Y (2003) Four new species of the Calyptratae (Diptera: Fanniidae, Muscidae, Calliphoridae) from Sichuan, China. *Entomological Journal of East China* 12(2): 1–6.
- Hennig W (1957) Muscidae. In: Lindner E (Ed.) *Die Fliegen der Palaearktischen Region*. Schweizerbart, Stuttgart, 145–192.
- Huckett HC (1965) The Muscidae of northern Canada, Alaska and Greenland (Diptera). *Memoirs of the Entomological Society of Canada* 42: 1–369. <https://doi.org/10.4039/entm9742fv>
- Ma ZY, Wu JW, Gui CY (1986) Two new species of the genus *Mydaea* R.-D. from China (Diptera: Muscidae). *Acta Zootaxonomica Sinica* 11(3): 316–321.
- Malloch JR (1920) Descriptions of new North American Anthomyiidae. *Transactions of the American Entomological Society* 46: 133–196.
- Pont AC (1977) A revision of Australian Fanniidae (Diptera: Calyptrata). *Australian Journal of Zoology* 51: 451–523. <https://doi.org/10.1071/AJZS051>
- Pont AC (1980) Family Muscidae. In: Crosskey RW (Ed) *Catalogue of the Diptera of the Afrotropical region*. British Museum (Natural History), London, 744–753.
- Pont AC (1986) Family Muscidae. In: Soos A, Papp L (Eds) *Catalogue of Palaearctic Diptera* (Vol. 11). Scathophagidae-Hypodermatidae. Akadémiai Kiadó, Budapest, 57–215.
- Pont AC (1989) Family Muscidae. In: Evenhuis NL (Ed.) *Catalog of the Diptera of the Australasian and Oceanian regions*. Bishop Museum Special Publication 86: 820–831.
- Ringdahl O (1924) Översikt av de hittill i vart land funna arterna tillhörande släktena *Mydaea* R. D. och *Helina* R. D. (Muscidae). *Entomologisk Tidskrift* 45: 49–66.
- Robineau-Desvoidy AJB (1830) Essai sur les Myodaires. Mémoires présentés par divers savants à l'Académie des sciences de l'Institut de France 2: 1–813.
- Shinonaga S (2003) *A Monograph of the Muscidae of Japan*. Tokai University Press, Tokyo, 347 pp.
- van Emden FI (1965) Diptera Volume 7, Muscidae, part 1. In: Sewell RBS, Roonwal ML (Eds) *The Fauna of India the Adjacent Countries*. Diptera, 7. Zoological Survey of India, Calcutta, 540–636.
- Vockeroth JR (1972) A review of the world genera of Mydaeinae, with a revision of the species of New Guinea and Oceania (Diptera: Muscidae). *Pacific Insects Monograph* 29: 1–134. <http://hbs.bishopmuseum.org/pim/pdf/pim29.pdf>
- Wei LM (1994) Descriptions of four new species of the genus *Mydaea* R.-D. from Guizhou China (Diptera: Muscidae). *Acta Entomologica Sinica* 37(1): 112–118.

- Xue WQ (1992) Muscidae. In: Fan ZD (Ed.) Key to the Common Flies of China (2nd edn.). Science Press, Beijing, 338–440.
- Xue WQ, Chao CM (1996) Flies of China (Vol. 1). Liaoning Science and Technology Press, Shenyang, 836–1365.
- Xue WQ, Tian X (2012) Genus *Mydaea* (Diptera: Muscidae) from China with description of two new species. Oriental Insects 46(2): 144–152. <https://doi.org/10.1080/00305316.2012.699265>
- Xue WQ, Tian X (2014) Keys to the species of *Mydaeinae* (Diptera: Muscidae) from China, with the description of four new species. Journal of Insect Science 14: 2–8. <https://doi.org/10.1093/jis/14.1.22>